

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-2, 4-9, 12-20, 23-30, and 33-40 are currently pending, Claims 1, 2, 5, 6, 8, 9, 12, 13, 15, 16, 18, 19, 23, 26, 27, 29, 30, 33, 35, 36, and 38-40 having been amended. The changes and additions to the claims do not add new matter and are supported by the originally filed specification, for example, on original Claims 5, 6, 8, 9, 15, 16, 18, 19, 26, 27, 29, 30, 35, 36, 38, and 39; and Figs. 5, 6, 7, 8, 13, 14, 15, 16, 19, 20, 21, 22, 25, 26, 27, and 28.

In the outstanding Office Action, the specification was objected to; Claims 1, 2, 4, 7, 12-14, 17, 20, 23-25, 28, 33-34, 37, and 40 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sugar et al. (U.S. 7,194,237, hereafter “Sugar”) in view of Pautler et al. (U.S. Pub. No. 2003/0185309, hereafter “Pautler”) and Onggosanusi et al. (U.S. Pub. No. 2004/0076224, hereafter “Onggosanusi”); and Claims 5, 6, 8, 9, 15-16, 18-19, 26-27, 29-30, 35, and 38-39 were objected to as being dependent upon a rejected base claim, but containing allowable subject matter.

Applicants thank the examiner and her supervisor for the courtesy of an interview extended to Applicants’ representative, Mr. Sameer Gokhale, on March 5, 2009. During the interview, the differences between the claims and the applied art were discussed. Further, clarifying claim amendments were also discussed. Arguments and claims similar to those presented during the interview are presented for formal consideration.

Applicants thank the examiner for the indication of allowable subject matter. In view of this indication, independent Claims 1, 2, 12, 13, 23, and 33 have been amended to recite a “received power estimation unit,” or a method step of “estimating a condition of received power,” which was recited in respective allowable claims 5, 6, 8, 9, 15-16, 18-19, 26-27, 29-30, 35, and 38-39. While the examiner did not provide a statement of reasons for allowance

for the above-mentioned allowable claims, Applicants submit that amended independent Claims 1, 2, 12, 13, 23, and 33 should be found allowable for the reasons discussed below.

With respect to the rejection of Claim 1 under 35 U.S.C. §103(a), Applicants respectfully submit that the amendment to Claim 1 overcomes this ground of rejection.

Amended Claim 1 recites, *inter alia*,

a received power estimation unit for estimating a condition of received power by using the information of channel estimation from the channel state estimating means, received signals received by L antennas and information of a known symbol;

a proper reception weight generating means for generating proper reception weights by using the condition of received power from the received power estimation unit, information of channel state from the channel information accumulation unit and the processed feedback information from the feedback-delay compensating means.

Sugar is directed to a system and method for multiple-input multiple-output (MIMO) radio communication. Fig. 1 of Sugar describes a system 10 that includes a first radio communication device 100 having N antennas which communicates with a second radio communication system 200 having M antennas. Sugar describes that device 100 has knowledge of a channel state between the two devices, which is characterized by a channel response matrix H. The device 100 uses a feedback technique to send this knowledge to the device 200. Fig. 5 of Sugar shows a receiver section 120B which includes a channel estimator 455 for providing channel estimation computations.

The Office Action acknowledges that Sugar fails to disclose or suggest “a signal dividing unit for dividing the transmission signal into 1 to K signal streams according to transmission weights derived from feedback information informed from the receiver through a feedback path; a signal modulator for modulating the 1 to K signal substreams respectively; a feedback delay compensating means for processing the feedback information in order to

compensate feedback delay of the feedback path; ***a proper reception weight generating means for generating proper reception weights by using the information of the channel state and the processed feedback information from the feedback delay compensating means***; and a signal combining unit corresponding to the signal dividing unit of the transmitter for combining the demodulated K signal streams from the demodulator to reproduce the original transmission signal.” (See Office Action, at pages 4-5).

Therefore, Applicants submit that Sugar must also fail to disclose or suggest “a proper reception weight generating means for generating proper reception weights by using the condition of received power from the received power estimation unit, information of channel state from the channel information accumulation unit and the processed feedback information from the feedback-delay compensating means,” as defined by amended Claim 1.

Applicants further submit that Sugar fails to disclose or suggest “a received power estimation unit for estimating a condition of received power by using the information of channel estimation from the channel state estimating means, received signals received by L antennas and information of a known symbol,” as defined by amended Claim 1.

Applicants note that the Office Action relies on Onggosanusi to disclose “a proper reception weight generating means for generating proper reception weights by using the information of the channel state and the processes feedback information from the feedback delay compensating means (means 425) in order to properly demodulate and recover/reproduce the original transmitted signal.” (See Office Action, at page 6).

Onggosanusi is directed to multipath interference-resistant receivers for closed-loop transmit diversity in CDMA systems. Fig. 2b of Onggosanusi shows a transmitter 105 with multiple antennas 110 and a receiver 115 with multiple antennas 120. Onggosanusi describes that the receiver 115 may provide to the transmitter 105 information such as channel state information or even weighting factors that can be used by the transmitter 105 to adjust its

transmission (see para. [0031]). Fig. 4 shows a generic receiver 400 which has a channel estimation block 410 which extracts a pilot channel from a received signal and creates an estimate of the communications channel using the extracted pilot channel (see para. [0049]). Fig. 4 also shows a transmitter weighting vector computer 415 which computes a weighting vector based on the estimation of the communications channel, but Onggosanusi does not describe the details of computing the terms of the weighting vector (see para. [0050]).

Therefore, Onggasonusi describes computing weighting vectors *based on an estimation of a communications channel*.

However, Onggasonusi does not disclose or suggest “*a received power estimation unit for estimating a condition of received power by using the information of channel estimation from the channel state estimating means, received signals received by L antennas and information of a known symbol*,” and “a proper reception weight generating means for generating proper reception weights *by using the condition of received power from the received power estimation unit*, information of channel state from the channel information accumulation unit and the processed feedback information from the feedback-delay compensating means,” as defined by amended Claim 1.

Thus, Applicants submit that Onggosanusi fails to remedy the deficiencies of Sugar with regard to amended Claim 1.

Pautler has also been considered but fails to remedy the deficiencies of Sugar and Onggosanusi with regard to amended Claim 1.

Therefore, Applicants respectfully submit that amended Claim 1 patentably distinguishes over Sugar, Pautler, and Onggosanusi, either alone or in proper combination.


Amended independent Claims 2, 12, 13, 23, and 33 recite features similar to those of amended Claim 1 discussed above. Therefore, Applicants respectfully submit that amended

Claims 2, 12, 13, 23, and 33 (and all associated dependent claims) patentably distinguish over Sugar, Pautler, and Onggosanusi, either alone or in proper combination.

Consequently, in light of the above discussion and in view of the present amendment, the outstanding grounds for rejection are believed to have been overcome. The present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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